Unit 15.5
Day 2
Graphing Rational Functions
Part 1

Rational expression

$\frac{h}{g}$, where h & g are polynomial and $g \neq 0$.

Rational function

$f(x)=\frac{h}{g}$

Finding the asymptotes of a rational functions

Three types of asymptotes:

1) Vertical asymptote $x = \#$

2) Horizontal asymptote $y = \#$

3) Oblique asymptote linear eq.

1) vertical asymptotes-is (are) vertical line(s) that the graph will never cross.

Finding the vertical asymptotes: set the denominator equal to zero to find the values of x that make the function undefined.

Ex1: $f(x)=\frac{x+1}{2x^2+5x-3}$

$2x^2+5x-3\neq 0$

$(2x-1)(x+3)=0$

$x=\frac{1}{2}$ $x=3$

Vert asym.

Ex2: $f(x)=\frac{3}{-x^3-5x^2-4x}$

$-x^3-5x^2-4x\neq 0$

$x=0,-1,-4$

$x=-1$

$x=-4$

FINDING HORIZONTAL ASYMPTOTES

1) If the

degree of the numerator = degree of the denominator

then

the horiz. asymptote equals the ratio of the leading terms

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2) If the

degree of the numerator < degree of the denominator

then

the horiz. asymptote y = 0.

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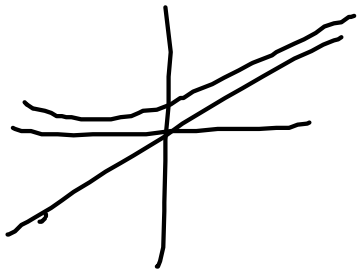
3) If the

degree of the numerator > degree of the denominator

then

divide the num. by den. The dividend is the oblique asymptote (ignore remaider)



Finding horizontal asymptotes:

Ex1 : $f(x)=\dfrac{x+1}{2x^2+5x-3}$

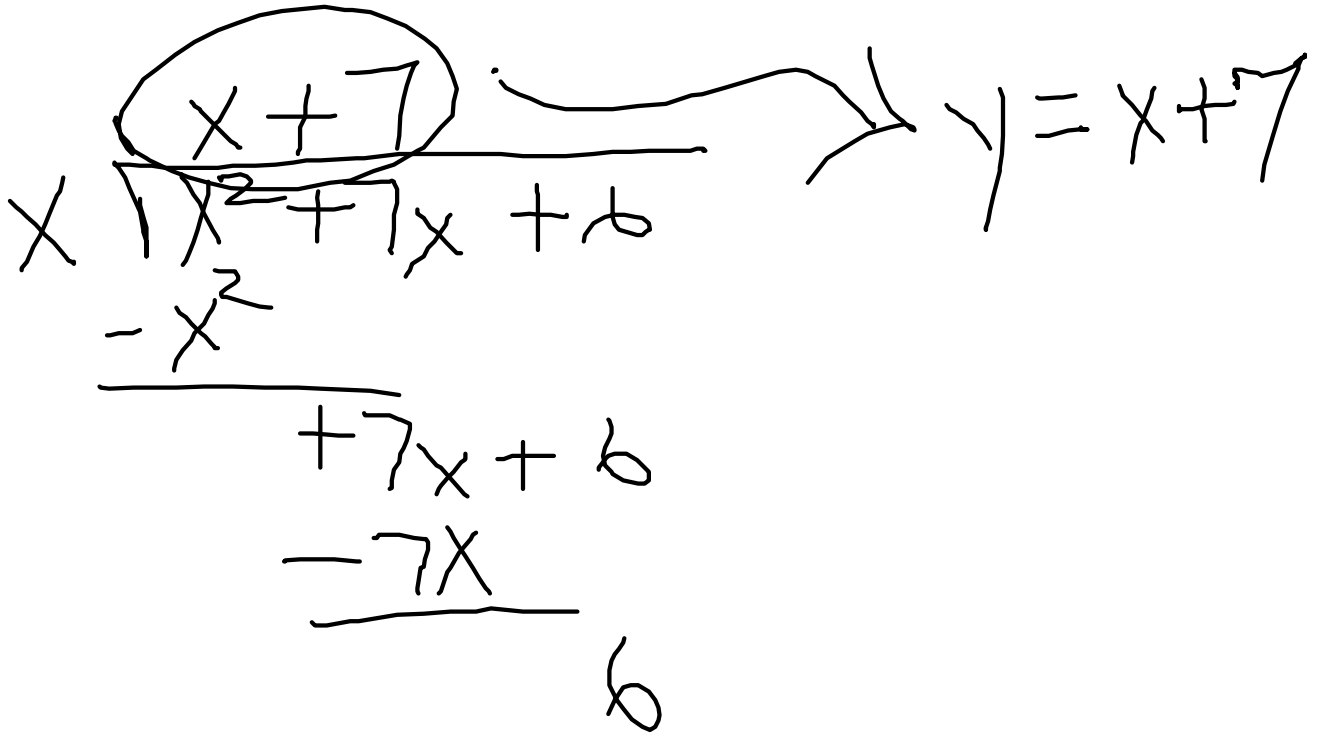
$y=0$

Ex2: $f(x)=\frac{2x^2-3x+1}{5x^2+6x+1}$

$y=\frac{2}{5}$

Finding an oblique asymptote:

Ex3: $f(x)=\frac{x^2+7x+6}{x}$



Homework

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